

BEST AVAILABLE COPY

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	FR	France	ML	Mali
AU	Australia	GA	Gabon	MR	Mauritania
BB	Barbados	GB	United Kingdom	MW	Malawi
BE	Belgium	HU	Hungary	NL	Netherlands
BG	Bulgaria	IT	Italy	NO	Norway
BJ	Benin	JP	Japan	RO	Romania
BR	Brazil	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	LI	Liechtenstein	SN	Senegal
CH	Switzerland	LK	Sri Lanka	SU	Soviet Union
CM	Cameroon	LU	Luxembourg	TD	Chad
DE	Germany, Federal Republic of	MC	Monaco	TG	Togo
DK	Denmark	MG	Madagascar	US	United States of America
FI	Finland				

Loader for holding and dispensing a washing additive.

This invention relates to a loading system which is particularly suitable for holding a cleansing agent in a washing machine and subsequently dispensing it as
5 required by the machine.

Existing apparatuses for loading a cleansing agent into a washing machine typically comprise a receptacle, such as a trough, which may be situated in a sliding drawer or under a flap, in order to allow access when
10 required. The cleansing agent, such as a detergent powder or liquid, is poured into the receptacle, usually at the start of the washing cycle, and retained there until it is required by the machine. When required, the cleansing agent is carried to the washing means of the
15 machine, usually by a flow of water directed through the receptacle, which then constitutes all or part of the water used for washing. Commonly the receptacle is divided into sections so that a portion of the cleansing agent may be retained for use in a second or
20 subsequent wash in the washing cycle.

A disadvantage of such apparatuses is their reliance on the operator to load the correct quantity of cleansing agent into the machine. Even when the loading requirements are stated as clearly and simply as
25 possible by the machine manufacturer and/or the powder manufacturers, the operator is often likely to put in too much or too little cleansing agent in the hope of obtaining a better wash or saving money. This

- 2 -

frequently results in the blame for poor washing results being put on the machine or the cleansing agent when in reality it is the operator's fault.

Further disadvantages are that with existing
5 systems it is necessary to perform the loading operation before every washing cycle, which can be inconvenient especially when washing several loads of clothes or linen one after another. Commonly a small amount of cleansing agent is left behind, stuck to the inside of
10 the receptacle when required by the machine, which means that too little reaches the wash. Similarly the recently introduced "liquid detergents", designed to replace washing powders, must have carefully controlled viscosity because if too thin, the detergent simply
15 flows into the machine before it is needed, and if too thick a portion tends to remain behind in the receptacle.

The object of this invention is to overcome or mitigate these and other problems, by providing an
20 improved apparatus which can conveniently and consistently load the correct amount of cleansing agent into a washing machine.

According to this invention there is provided a loader for holding and dispensing a washing additive in
25 use, including a receptacle for the washing additive, the receptacle having at least one opening therein through which the washing additive may pass to be dispensed, and being arranged such that, in use, the

washing additive is held in the receptacle in a manner which permits the washing additive to be dispensed in a plurality of discrete portions.

Preferably the portions of washing additive are advanced in steps, when required, by advancing means which bring each portion in turn adjacent to an opening, to be passed through the opening by gravity or by pressure exerted through adjacent portions.

Advantageously at least some of the portions of washing additive may be of non-detergent substances such as dye, fabric conditioner or bleach or any combination thereof.

Preferably the portions take the form of packets containing cleansing agent and having soluble walls, so as to allow the release of the contents upon immersion in water within the machine.

The invention also includes a washing machine including a washing means, and a loader for a washing additive such as a cleansing agent for automatically dispensing discrete portions of washing additive into the washing means at predetermined intervals.

According to a specific aspect of this invention there is provided a loader for loading a washing additive into a washing machine, including a receptacle for holding the washing additive before it is required by the washing machine, the receptacle having, or being providable with, an opening through which the washing additive may pass to be dispensed when required by the

washing machine, wherein the loader is arranged such that a portion of the washing additive and the opening may be brought into proximity with each other whereby the washing additive may pass through the opening to be
5 dispensed in discrete portions when required by the washing machine.

This invention also includes a method of dispensing a washing additive from a receptacle provided in a washing machine, comprising the steps of providing the
10 receptacle with sufficient washing additive for a plurality of washing cycles, and dispensing the washing additive from the receptacle in discrete portions as required by each washing cycle.

Preferably the method of this invention comprises
15 providing the washing additive in the form of a plurality of separate additive units such as blocks or packets, and dispensing at least one of the additive units as a discrete portion for each cycle.

This invention will now be described by way of
20 example, with reference to the accompanying drawings in which:-

Figure 1 is a schematic part-sectioned perspective view of a first embodiment of the invention;

Figure 2 is a schematic part-sectioned perspective
25 view of a second embodiment of the invention.

Referring now to Figure 1, a cleansing agent loader 10 of generally elongated cuboid shape is intended for use as a drawer in the manner of the loaders fitted to many current washing machines, although details of sliders, handles etc form no part of this invention and are not shown. Accordingly in this instance, the loader is dimensioned so as to fit within the size of slot which is typically provided for this purpose in a machine.

10 The loader 10 has an elongate opening 12 formed in its upper surface and extending over most of its length, width and depth, leaving relatively thin base 14, side 16, and end 18 walls so that the opening takes up most of the volume of the loader. Two spools 20 of like diameter are situated within the opening 12 along its longitudinal axis, one adjacent each respective end, and can rotate about axes which are parallel to each other and perpendicular to the inner surface of the base wall 14. The spools 20 support a wide continuous belt 22 of 15 rubber or other like flexible material which extends around them, contacting about half of the arcuate surface of each spool in a fashion which substantially synchronises their rotation. The belt 22 has a plurality of flaps 24 disposed at equal spacing around 20 its periphery, which each extend substantially perpendicularly from the continuous spool-contacting web of the belt towards the side 16 or end 18 walls of the loader. The flaps 24 partially define discrete

- 6 -

compartments 26 between them, the side 16 or end 18 walls and the belt 22, each of which is dimensioned to accept a block 28 which consists of, or contains, a given amount of cleansing agent.

5 In use, the loader 10 is filled with cleansing agent by first pulling it out as a drawer to gain access, and then placing a block 28 in each available compartment 26 other than the compartment over open port 30 in the base wall 14. The loader is then pushed back
10 into the washing machine, so that the port 30 is positioned over means such as a chute (not shown) for carrying cleansing agent towards the washing means of the machine. Conveniently, at the same time driving means, such as a small electric stepper motor or a
15 manually-activated linkage, can be connected to the loader, for instance by gears which mesh when the loader is pushed in (not shown). In this way one or other of the spools 20 can be driven so as to advance the belt 22 in discrete steps whose size corresponds to the gap
20 between adjacent flaps 24. If not driven, a spool acts as an idler, simply supporting belt 22 in the required position as it_n is moved.

When cleansing agent is required by the machine, the driving means are activated either on the operator's
25 or machine's command, which advances the belt 22 by the aforementioned step. When the loader is correctly filled this carries a block 28 over the port 30, which then falls through the port and is thereby dispensed

into the machine, as shown. Further blocks 28 can be dispensed in a similar fashion until all are used up, whereupon the loader can be slid out from the machine and refilled. Arcuate end sections 32, whose centres of curvature preferably lie on the axis of the adjacent spool 20, help to minimise the possibility of jamming when in operation.

Blocks 28 are shown as compressed blocks of detergent powder, intended to fragment and dissolve when they fall into the washing machine. However the blocks could take the form of packets containing liquid or powder detergents, the walls of a packet preferably being soluble so as to release its contents upon contact with the washing water. Alternatively some form of puncturing means could be used to gain access to the contents of a packet, once dispensed by the apparatus of this invention. The blocks could be replaced by refillable cassettes which are adapted to remain in the loader, even when over the open port, while allowing their contents to pour out through an opening in the base when required.

Advantageously, some of the blocks could contain or consist of other agents used in laundering clothes and linen, such as fabric conditioner, dye or bleach. By loading such blocks in a given sequence, the loader could be used to dispense them as required by the wash program in the same way as the detergent blocks.

Turning now to Figure 2, a second embodiment of the loader 10 is again dimensioned and shaped so as to fit into a typically-sized loader slot of current machines. Again the loader is in the form of a drawer, having an open port 30 which lies over means for carrying blocks 28 into the wash, when the drawer is closed. In this embodiment, several blocks 28 are loaded firstly into a cartridge 34, two of which can lie side-by-side, separated by a divider 36 which extends along the longitudinal axis of loader 10. Cartridge 34 is rectangular in plan, as defined by two parallel end plates 38 and side plates 40. Parallel to the end plates 38 and equispaced along the length of cartridge 34 are several dividing plates 42, which define between themselves a plurality of compartments each dimensioned to accept a block 28. Cartridge 34 is open on its underside to allow blocks 28 to fall through when required.

In use, cartridges 34 are filled with blocks 28 and placed into the channels on either side of divider 36 in the loader 10, which is then slid into the washing machine. Once the loader is inserted, a pawl or gear (not shown) engages a rack 44 situated on a side plate 40 of cartridge 34, by extending through slot 46 cut out of a side of the loader drawer 10. Although these details are not shown on the far side of the embodiment shown in Figure 2, the same thing happens there. The pawl or gear, driven manually or automatically by the

machine, advances one or other of the cartridges 34 in steps whose length corresponds with the spacing between dividing plates 42. As each compartment of a cartridge 34 travels over port 30, a block 28 falls through and is
5 dispensed into the machine, until when all compartments are empty the other cartridge is advanced in the same fashion. When empty, a cartridge 34 is retracted, by means of the pawl or gear, back to its starting position, so as to allow the loader 10 to be withdrawn
10 for refilling.

Although the embodiments described above are primarily designed to suit machines of the type currently popular i.e. to fit in the space generally devoted to a washing powder receptacle such as a drawer,
15 it will be clear that by designing all-new machines benefits may be had in the storage capacity and simplicity of these embodiments.

Further variations are possible, for instance the blocks may be held in a dispenser having a "trap door"
20 under each block, with no need to move the blocks over an open port in order to dispense them. Another alternative is to provide a cylinder, filled with liquid detergent, in which a piston is driven along the cylinder in steps so as to dispense a given quantity of
25 detergent at each step.

It will be clear to those skilled in the art that the invention could also be applied to machines for washing items other than clothes, such as dishwashers.

CLAIMS

1. A loader for holding and dispensing a washing additive in use, including a receptacle for the washing additive, the receptacle having at least one opening therein through which the washing additive may pass to
5 be dispensed, and being arranged such that, in use, the washing additive is held in the receptacle in a manner which permits the washing additive to be dispensed in a plurality of discrete portions.

2. A loader according to Claim 1, further
10 including a plurality of compartments, each compartment being for receiving a discrete portion of washing additive.

3. A loader according to Claim 2, wherein the compartments are at least partially defined by a movable
15 body.

4. A loader according to Claim 2 or Claim 3, wherein the compartments are defined between the walls of the receptacle and a continuous belt having a plurality of partitions thereon, the belt being movable
20 to bring the portions in turn into proximity with the opening or openings.

5. A loader according to Claim 2 or Claim 3, wherein the compartments are provided in one or more cartridges, the or each cartridge being movable to bring
25 the portions in turn into proximity with the opening or openings.

6. A loader according to Claim 2, wherein some or all of the compartments each have an associated member operable to provide an opening.

7. A loader according any of Claims 2 to 6,
5 wherein the portions are discrete blocks.

8. A loader according to any preceding Claim, wherein the washing additive is caused to pass out of the opening or openings by force of gravity.

9. A loader according to any preceding Claim,
10 wherein the washing additive is caused to pass out of the opening or openings by pressure exerted through the washing additive.

10. A washing machine including a loader according to any preceding Claim.

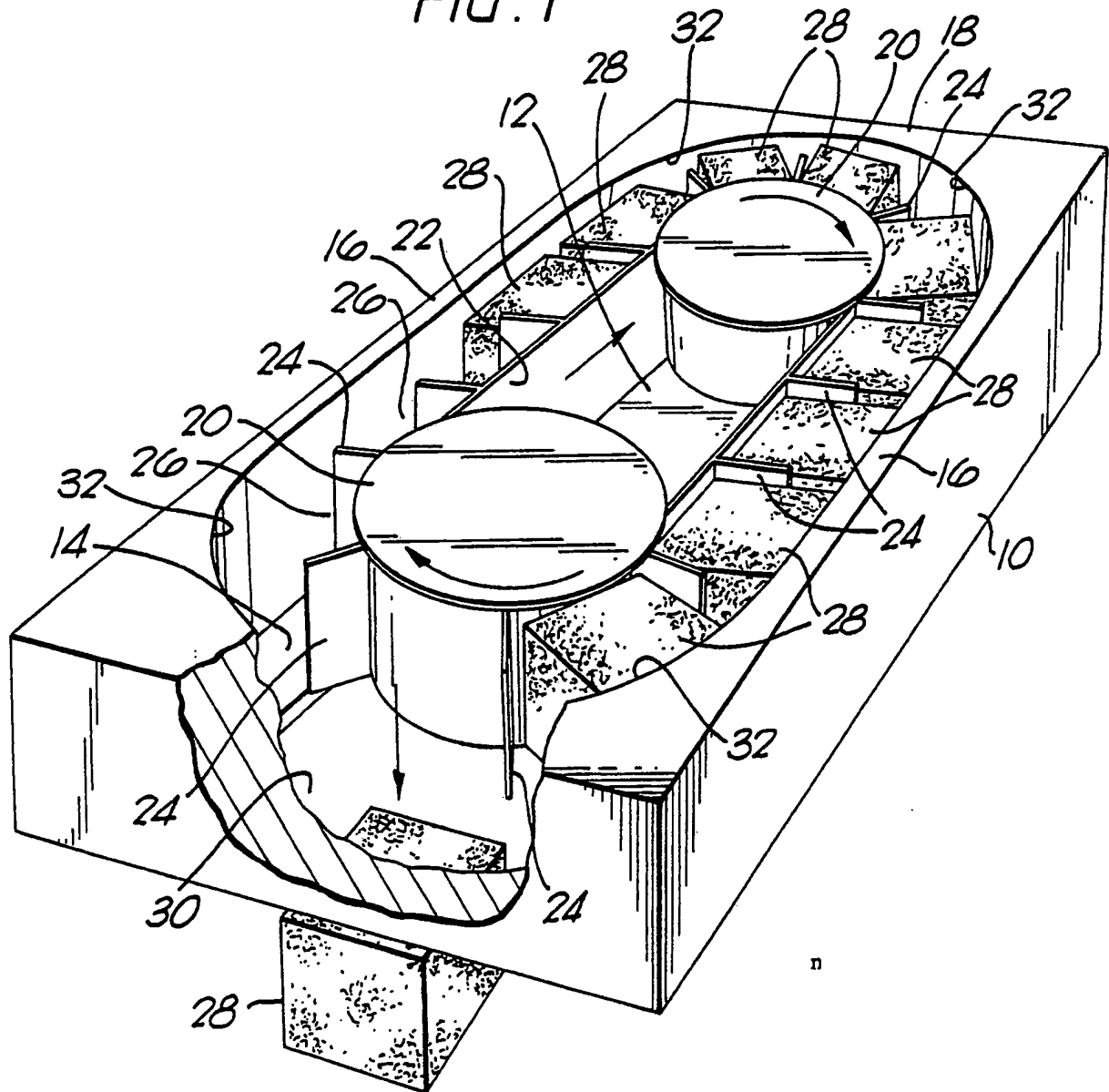
15 11. A loader for loading a washing additive into a washing machine, including a receptacle for holding the washing additive before it is required by the washing machine, the receptacle having, or being providable with, an opening through which the washing additive may
20 pass to be dispensed when required by the washing machine, wherein the loader is arranged such that a portion of the washing additive and the opening may be brought into proximity with each other whereby the washing additive may pass through the opening to be
25 dispensed in discrete portions when required by the washing machine.

12. A method of dispensing a washing additive from a receptacle provided in a washing machine, comprising the steps of providing the receptacle with sufficient washing additive for a plurality of washing cycles, and
5 dispensing the washing additive from the receptacle in discrete portions as required by each washing cycle.

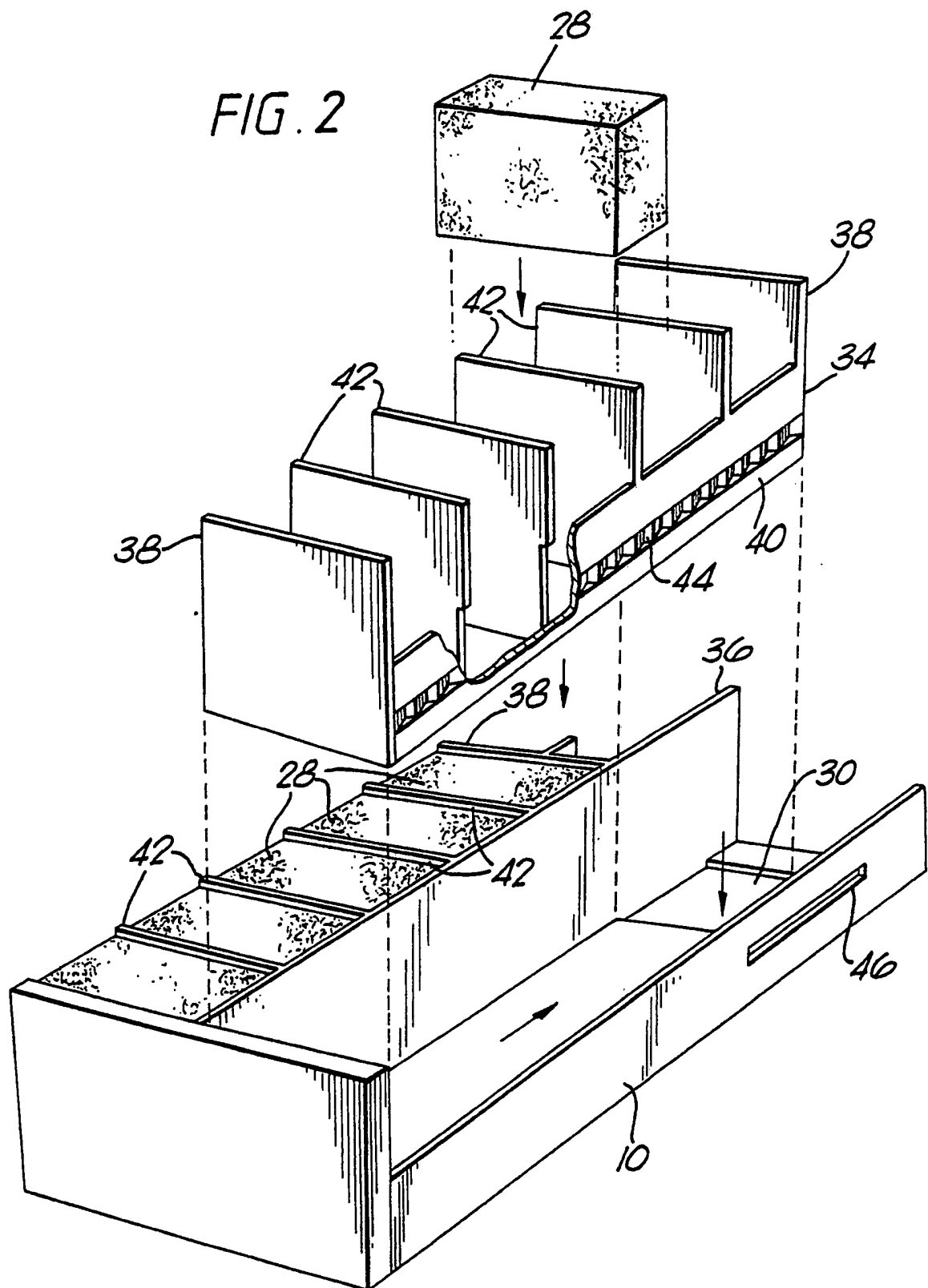
13. A method according to Claim 12 comprising providing the washing additive in the form of a plurality of separate additive units such as blocks or
10 packets, and dispensing at least one of the additive units as a discrete portion for each cycle.

14. A method according to Claim 12 or Claim 13 wherein the dispensing step comprises effecting movement between the additive and the receptacle so that a
15 discrete portion of washing additive is brought into proximity with an opening through which the washing additive is dispensed.

FIG. 1



2/2



INTERNATIONAL SEARCH REPORT

International Application No **PCT/GB 88/00093**

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC ⁴ : D 06 F 39/02		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
IPC ⁴	D 06 F; A 47 L	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category ⁹	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	US, A, 3178915 (SIEMENS) 20 April 1965 see figures; claims --	1,7,9-14
X	US, A, 3062030 (R.C. GROVES) 6 November 1962 see figures; column 3, lines 29-64; column 6, lines 48-59 --	1-4,8,10-14
X	WO, A, 82/00482 (ELECTROLUX) 18 February 1982 see figure 1; abstract --	1-3,8,10-12,14
X	US, A, 3988908 (FEDDERS CORP.) 2 November 1976 see figures; abstract --	1-3,5,8,10,11
X	US, A, 2948437 (C.E. NIELSEN) 9 August 1960 see figures 1-4,8; claims --	1,2,6,10,11
X	WO, A, 82/00753 (ELECTROLUX) 18 March 1982 see figures; claims -----	1,9-12,14
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>[*] Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p> </div> </div>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
11th May 1988	13 JUN 1988	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	P.C.G. VAN DER PUTTEN	

BEST AVAILABLE COPY

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

GB 8800093

SA 20777

This annex lists the patent-family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 02/06/88. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 3178915		DE-A- 1403674 CH-A- 405637	24-10-68
US-A- 3062030		None	
WO-A- 8200482	18-02-82	SE-A- 8005655 EP-A, B 0057217 SE-B- 436582	12-02-82 11-08-82 07-01-85
US-A- 3988908	02-11-76	None	
US-A- 2948437		None	
WO-A- 8200753	18-03-82	SE-A- 8006035 EP-A, B 0058691 US-A- 4516696 SE-B- 444638	01-03-82 01-09-82 14-05-85 28-04-86

BEST AVAILABLE COPY